

CASE REPORT

Medicine Science 2019;8(3):756-8

Migrated thrombus extending from right atrium to left atrium through patent foramen ovale: Two case reports

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Received 27 October 2018; Accepted 10 February 2019
Available online 31.03.2019 with doi:10.5455/medscience.2018.07.8999

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Abstract

Venous thromboembolism is a common disease with conditions ranging from clinically asymptomatic deep vein thrombosis to fatal pulmonary embolism. Venous thromboembolism is the most important cause of paradoxical embolism and pulmonary embolism. In this case report we present a case of thrombus extending from the right atrium to the left atrium through patent foramen ovale.

Keywords: Migrated thrombus, patent foramen ovale, thromboembolism

Introduction

Venous thromboembolism that usually generates from deep venous thrombus is the most important reason of pulmonary and paradoxical embolism through the vena cava and heart cavities [1]. In the course of pulmonary or systemic embolism, migrated thrombus came from lower limb is seen very rarely within right or left atrium especially within patent foramen ovale on echocardiography [2]. This report describes two very rare cases of thrombus extending to left atrium through patent foramen ovale accompanying pulmonary emboli.

Case 1

51 years-old male patient administered emergency department with dyspnea, chest pain and syncope. In the medical history of the patient, he had used warfarin for deep vein thrombosis (DVT) before, but he was using acetyl salicylic acid currently. Blood pressure was measured 105/75 mmHg. Initial Electrocardiography (ECG) showed only sinus tachycardia in the emergency room. Transthoracic echocardiography (TTE) was performed and it demonstrated thrombus extending from right atrium to left atrium through patent foramen ovale. While left part of the thrombus in the left atrium was measured 2.1 cm, right atrial side was 3.4

cm (figure 1). Systolic pulmonary artery pressure was 55 mmHg and it was thought that this pulmonary hypertension was caused

by embolic thrombus. Transesophageal echocardiography could not be performed since increase of right atrial pressure during retching could cause systemic and / or pulmonary embolism. The hemodynamically stable patient was hospitalized for cardiovascular surgery and successful operation was performed.

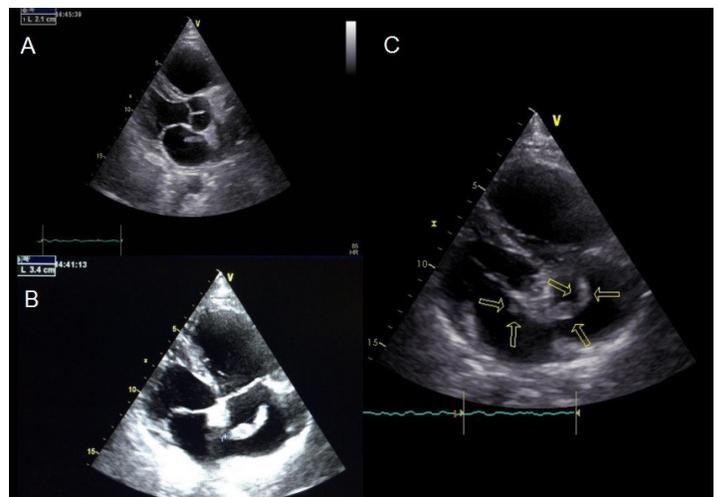


Figure 1. A: Left atrial thrombus. B: Right Atrial thrombus. C: Thrombus Extending From Right Atrium to Left Atrium through Patent Foramen Ovale

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Case 2

71 years-old woman with left hemiplegia whose had diagnosed inoperable cerebral tumor 5 month ago, came to emergency department with sudden starting shortness of breath. There was found that tachycardia and 3/6 systolic murmur in the auscultation, hypoxia in the arterial blood gas measurements and S1Q3T3 on the ECG. Therefore, in the thoracic computed tomography, which was performed for the pre-diagnosis of pulmonary thromboembolism, thrombus was detected in bilateral main pulmonary arteries (figure 2). On the transthoracic echocardiographic imaging right heart chambers dilated, moderate-severe tricuspid valve regurgitation was seen and pulmonary artery pressure was measured 65 mmHg. Thrombus which was 0.9x2 cm and was moving to left ventricle during diastole was seen extending to left atrium through aneurysmatic interatrial septum (figure 2). There was connected that present pulmonary emboli were owing to broken off right atrial part of thrombus obstructed bilateral main pulmonary arteries. Transesophageal echocardiography could not be performed due to the risk of systemic embolism. The thrombolytic therapy could not be performed because of inoperable cerebral tumor and hemodynamic instabilization. Department of cardiovascular surgery advised surgery but patient and her family refused.

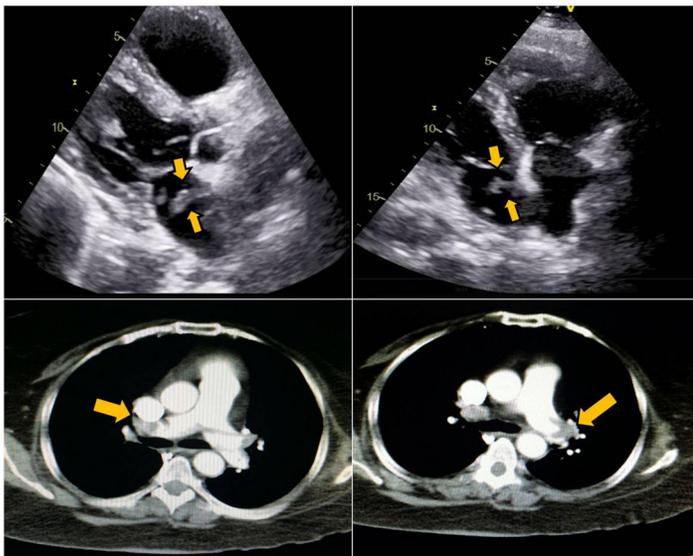


Figure 2. A-B: Left Atrial Thrombus. C-D: Pulmonary embolism in computed tomography

Discussion

Rudolph Virchow who was one of 19th century's public health activist, social reformer, politician, and anthropologist described a triad about risk of venous thrombosis composed of endothelial injury, stasis and hypercoagulable state [3,4]. With the another additional risk factors, those conditions cause venous thrombosis and embolic events, which all process name as venous thromboembolism (VTE). The term VTE includes both deep vein thrombosis (DVT) and pulmonary embolism (PE). Clinically, patients with VTE can be identified when applying with DVT, PE or both. Almost 2/3 patients of VTE administer with DVT and rest of patients exist with PE. PE is the most important complication and is main cause of mortality and morbidity of VTE [5]. Until now, studies have shown that %7 to 18 patients with PE exist

floating thrombus in right heart cavities and this situation has been shown high mortality rate (>%40) [6,7]. Observation of free-floating thrombus in right heart chambers, superior or inferior vena cava is classically named as "thrombus-in-transit" [2].

The patent foramen ovale (PFO), a congenital heart defect, is seen in 1/3 to 1/4 of adult and its pure presence is not clinically important. However, PFO is associated with migraine, vascular headache, cryptogenic stroke and air embolism but if the patients are asymptomatic treatment does not require [8]. Because of acutely increased pulmonary artery pressure origin of PE or a Valsalva maneuver, patent foramen ovale can pass a thrombus to the left atrium and thus this condition can lead to paradoxical embolism. If the size of thrombus is big, during right atrial pressure elevation it is pushed toward the left atrium and it may be trapped by foramen ovale, which this situation is referred as "impending paradoxical embolism (IPE)" [1]. Although almost ¼ of adult have patent foramen ovale paradoxical embolism is seen very few of them. Both two cases presented here is consistent with impending paradoxical embolism.

About treatment of IPE, discussions are continuing and treatment options is not clear yet. In a systematic review by Mayer et al. there were emphasized that individualization of treatment is very important owing to "heterogeneity and complexity" of patients with IPE [1]. But the last randomised clinical trials have shown evidence of benefit for device closure as compared with medical therapy in patients with cryptogenic stroke[9]. The most common treatment options include fibrinolytic, surgical, anticoagulant and device closure therapy. Meta-analyses of observational and/or randomised studies suggest that the annual recurrence rate on medical therapy ranges from 0% to 5.8% for stroke and from 0% to 14% for either stroke or transient ischaemic attack (TIA) [10-12]. Our first patient was underwent to surgery, after successful thromboembolectomy the patient died because of respiratory insufficiency in intensive care unit. Since another case did not accept surgery and thrombolytic treatment were not administered because of contraindication (inoperable cerebral tumor), anticoagulant therapy were used. On the course of illness, shortness of breath occurred and the patient died of cardiopulmonary arrest.

Competing interests

The authors declare that they have no competing interest.

Financial Disclosure

All authors declare no financial support.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards

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